

(19)



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(11)

EP 0 819 786 A3

(12)

EUROPEAN PATENT APPLICATION

(88) Date of publication A3:
22.12.1999 Bulletin 1999/51

(51) Int Cl.⁶: **C30B 33/08, C30B 29/06**

(43) Date of publication A2:
21.01.1998 Bulletin 1998/04

(21) Application number: **97305224.4**

(22) Date of filing: **15.07.1997**

(84) Designated Contracting States:
**AT BE CH DE DK ES FI FR GB GR IE IT LI LU MC
NL PT SE**

(30) Priority: **16.07.1996 US 680809**

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(54) **Etch process for single crystal silicon**

(57) A process for etching shallow trenches in single crystal silicon is described. The process etchant comprises HBr/Cl₂/O₂/He. The process can be used with various mask **24** schemes including, for example, photoresists, oxide hardmasks and nitride hardmasks. The process forms shallow trenches **32** typically having a width of from about 0.25 microns to about 1 micron, and a depth of from about 0.3 microns to about 1 micron. The shallow trenches **32** have rounded bottom corners

38, smooth and continuous sidewalls **34** and substantially flat and clean bottoms **36**. For a given trench width, the profile angle is substantially uniform across the single crystal silicon. The trench depth is substantially uniform across the silicon also. In addition, the profile angle is substantially independent of the trench depth. The process can comprise one or two etch steps for etching the single crystal silicon. The two-step etch process forms shallow trenches having varying profile angles with respect to the trench depth.

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EUROPEAN SEARCH REPORT

Application Number
EP 97 30 5224

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The present search report has been drawn up for all claims			
Place of search THE HAGUE		Date of completion of the search 19 October 1999	Examiner Köpf, C
<p>CATEGORY OF CITED DOCUMENTS</p> <p>X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document</p> <p>T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons</p> <p>& : member of the same patent family, corresponding document</p>			

EPO FORM 1503 03 82 (P04C01)

**ANNEX TO THE EUROPEAN SEARCH REPORT
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